IN THE CLAIMS

The following amendments to the claims are made pursuant to the requirements of 37 C.F.R. § 1.121(c). A claim listing is provided beginning on the next page of this response.

Please cancel claims 13-16 and 19-20 without prejudice or disclaimer.

Please amend claims 1, 4-6, 9-12, and 17-18 as set forth below.

Please add new claims 21-31.

1.   (currently amended) An intra-oral laser digitizer <u>system</u> comprising:

a light source having collimating optics configured to generate a collimated beam of light;

a scanner optically coupled to the light source and configured to scan the collimated beam along at least two axes <u>to generate a pattern</u>;

an optics relay coupled to the scanner and configured to relay the ~~scanned, collimated beam~~ <u>the pattern</u> towards a remote object to be imaged;

an image optics system having an optical axis configured to detect a reflection of the ~~scanned beam~~ <u>pattern</u> from the <u>remote</u> object at an angle θ with respect to the optics relay and to generate data representative of a surface of the object based on the ~~reflected beam~~ <u>reflection of the pattern</u>; and

a processor coupled to the scanner and the image optics system configured to generate a three-dimensional image of the object based on the data.

2.   (original) The intra-oral laser digitizer of claim 1 where the light source comprises a laser LED.

3.   (original) The intra-oral laser digitizer of claim 1 where the scanner comprises a plurality of mirrors.

4.   (currently amended) The intra-oral laser digitizer of claim 3 where the image optics system comprises:

an image sensor configured to detect a triangulation image of the object, the triangulation image based on <u>the pattern, wherein the pattern comprises</u> a plurality of curves generated by scanning the beam of light on the <u>remote</u> object during an exposure period; and

an imaging lens system configured to focus the plurality of curves on the image sensor.

5.   (currently amended) The intra-oral laser digitizer of claim 4 where the processor is configured to merge multiple images of the <u>remote</u> object to generate a three-dimensional map of the <u>remote</u> object.

6.   (currently amended) The intra-oral laser digitizer of claim 5 where the <u>remote</u>

object comprises any one of: an in vivo dental item, a dental preparation, a dental model, a dental mold, or a dental casting.

7.   (original) The intra-oral laser digitizer of claim 1 where the scanner comprises a single mirror configured to scan the light along at least two-axes.

8.   (original) The intra-oral laser digitizer of claim 1 where the scanner comprises a rotatable mirror and a spinning polygon mirror.

9.   (currently amended) The intra-oral laser digitizer of claim 1 where the scanner further comprises a programmable position controller configured to control the scan of the collimated ~~laser~~ beam of light in a programmed scan sequence.

10.   (currently amended) The intra-oral laser digitizer of claim 1 where the ~~known~~ pattern comprises a plurality of curves, with each ~~is~~ curve being substantially parallel to ~~each other~~ one another.

11.   (currently amended) The intra-oral laser digitizer of claim 1 where the ~~laser~~ light source comprises a low coherence light source~~, the reflected light from the object being compared with light from the low coherence source reflected from a known variable path length~~.

12.   (currently amended) The intra-oral laser digitizer of claim 1 further comprising a ~~voice recognition means for controlling~~ voice recognizer to control a given operation ~~of the intra-oral laser digitizer~~ in response to a voice ~~commands~~ command ~~of an operator~~.

13-16. (cancelled)

17.   (currently amended) A method for generating a three-dimensional visual image of an in vivo object comprising:

generating a multi-axis collimated beam of light, the collimated beam of light being generated remotely from the object;

~~scanning the multi-axis collimated beam of light,~~ from a first position with respect to the object, scanning the multi-axis collimated beam light <u>over a given time interval to generate a</u> ~~in a second~~ pattern, where the pattern ~~includes~~ <u>comprises</u> a plurality of substantially parallel curves ~~having curvilinear segments~~;

<u>relaying the pattern of substantially parallel curves from the first position to a second position with respect to the object;</u>

<u>from the second position, projecting the pattern onto the object;</u>

<u>at a third position with respect to the object, receiving a reflection of the pattern;</u>

<u>relaying the reflection of the pattern from the third position to a fourth position;</u>

capturing ~~an image of a~~ <u>the</u> reflection of the pattern ~~from the object during an exposure period~~; and

determining a map of ~~the~~ <u>a</u> surface of the object based on the captured ~~image~~ <u>reflection</u>.

18.   (currently amended) The method of claim 17 wherein the ~~act of scanning further comprises relaying the multi-axis collimated beam of light to an object in oral cavity~~ <u>second position and that third position are at an angle θ with respect to one another</u>.

19-20 (cancelled)

21.   (new) The intra-oral laser digitizer as described in claim 1 wherein the pattern comprises a set of segments.

22.   (new) The intra-oral laser digitizer as described in claim 21 wherein each segment is a curve.

23.   (new) The intra-oral laser digitizer as described in claim 1 wherein the image optics system comprises an image sensor, an optical element that detects the reflection of the pattern, and an optics relay coupled to the optical element and configured to relay the reflection of the pattern from the optical element to the image sensor.

24.   (new) The intra-oral laser digitizer as described in claim 23 wherein the optics relay coupled to the optical element is co-linear to the optics relay coupled to the scanner.

25.   (new) An intra-oral laser digitizer, comprising:

a light source having collimating optics configured to generate a collimated beam of light;

a scanner optically coupled to the light source and configured to scan the collimated beam along at least two axes to generate a pattern comprising a set of segments;

a first optics relay coupled to the scanner and configured to relay the pattern towards a remote object to be imaged;

an optical element configured to detect a reflection of the pattern from the object at an angle θ with respect to the first optics relay; and

a second optics relay, co-linear to the first optics relay, the second optics relay coupled to the optical element and configured to relay the reflection of the pattern toward an image sensor.

26.   (new) The intra-oral laser digitizer as described in claim 25 wherein the image sensor generates a first data set representative of a surface of the object based on the reflection of the pattern.

27.   (new) The intra-oral laser digitizer as described in claim 26 wherein the scanner generates a second pattern comprising a set of segments, and wherein the image sensor generates a second data set representative of a surface of the object based on a reflection of the second pattern.

28.   (new) The intra-oral laser digitizer as described in claim 27 further including a processor, under program control, to generate a three-dimensional image of the object based on the first and second data sets.

29.   (new)   The intra-oral laser digitizer as described in claim 25 further including a program-controlled processor that generates a representation of the object based on the reflection of the pattern as detected by the image sensor.

30.   (new)   An intra-oral laser digitizer, comprising:

a light source having collimating optics configured to generate a collimated beam of light;

a scanner optically coupled to the light source and configured to scan the collimated beam along at least two axes;

a first optics relay coupled to the scanner and configured to relay the scanned collimated beam of light towards a remote object to be imaged, wherein over a given scanning period the scanned collimated beam of light generates a pattern comprising a set of segments;

an image sensor;

an optical element configured to detect a reflection of the scanned collimated beam from the object at a given triangulation angle θ; and

a second optics relay, co-linear to the first optics relay, the second optics relay coupled to the optical element and configured to relay the reflection of the scanned collimated beam toward the image sensor, wherein over the given scanning period the reflection of the scanned collimated beam on the image sensor comprises a modified pattern.

31.   (new)   The intra-oral laser digitizer further including a processor that uses the modified pattern, together with at least one other modified pattern generated as a result of scanning the collimated beam of light in a second pattern, to generate a representation of the remote object.